MULTIPLE MOTION CONTROL SYSTEM OF ROBOTIC CAR BASED ON IOT TO PRODUCE CLOUD SERVICE

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I. ABSTRACT

The world of control is an exciting field that has exploded with new technologies where the Internet of Things (IOT) vision becomes reality. This paper proposes a multiple motion robot car controlling mechanism of a robotic car using controller which works. Each device is uniquely identifiable by the controlling software which is the core concept of IOT. The information sending to the Commands and data are stored in cloud service which delivers them when the device is ready to receive. A GPS system is incorporated thus clients can trace the car. The system has ultrasonic distance sensor for avoiding obstacles coming in between its path. This paper proposes a robotic car where we will control its movement remotely using controller. Client can manages the activities of the car from remote or far away spots over the remote correspondence using Bluetooth module and cloud service. We present the architecture and design of the ARM processor and illustrate how to control the car by means of commands and application.

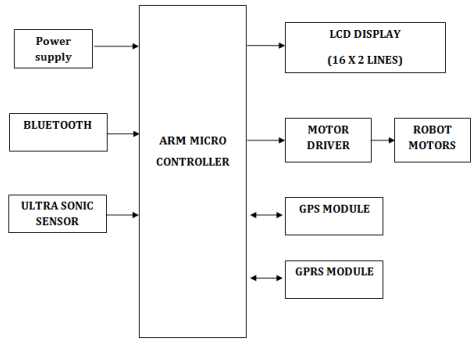
Keywords: Microcontroller, GSM, Voice module, Speakers, Devices etc.

II. INTRODUCTION

The IOT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. In our project we can control the vehicle by using GPS and GPRS i.e. we are sending the commands from our android mobile through Bluetooth, then the vehicle receives (acts as receiver) the signals, according to the commands being received from the mobile based on that the direction of the vehicle is controlled. As well as we can control the robot from the IOT by using GPRS (transceiver).When IOT is augmented with sensors, the technology becomes an instance of the more general class of cyber-physical systems. Several advanced control systems of

robots have been developed based on existing control techniques or new control techniques that have been built on purposes. Develop a multiple robot car controlling system that allows clients to control robots from distant places through voice commands and client application over the internet. Wireless connection is considered here. In this paper, the motion control system of robotic car is considered. Initially the commands include: move forward, move backward, turn left, turn right, rotate left, rotate right, activate obstacle detection, and deactivate obstacle detection. Also the ultrasonic distance sensor helps the robot to avoid collision with objects coming in between its path. Based on the command received lpc2148 takes appropriate action. The GPS sensor continuously Pings for getting the actual location of the car. Lpc2148 also pings the ultrasonic distance sensor for distance of obstacle before the car. Based on the commands, lpc2148 changes the direction and speed of the motors using the motor controllers.

III. BLOCK DIAGRAM



Fig(3.1). System block diagram

System Overview

Power Supply:

This section is meant for supplying Power to all the sections mentioned above. It basically consists of a Transformer to step down the 230V ac to 9V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification the obtained rippled dc is filtered using a capacitor Filter. A positive voltage regulator is used to regulate the obtained dc voltage.

Microcontroller:

This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

ARM7:

ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs

LCD Display:

This section is basically meant to show up the status of the project. This project makes use of Liquid Crystal Display to display / prompt for necessary information.

Bluetooth:

AUBTM-22 is a Bluetooth v1.2 module with SPP profiles. The module is intended to be integrated into another host system which requires Bluetooth functions. The HOST system could send commands to AUBTM-22 through a UART. AUBTM-22 will parse the commands and execute proper functions, e.g. set the maximum transmit power, change the name of the module. And next the module can transmit the data receive from the UART with SPP profiles.

Ultrasonic sensor:

The ultrasound transmitter TX is emitting ultrasound waves into sensor ambient space continuously. These waves are reflecting from various objects and are reaching ultrasound receiver RX. There is a constant interference figure if no moving objects are in the placement.

DC Motor:

DC motor is an output for this project. And DC motor is connected to microcontroller. And this motor controlled by the microcontroller with the respective inputs given by us. Its speed will be varied according to the speed set by the switches.

Driver circuit:

L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors.

GPS modem:

A GPS modem is used to get the signals and receive the signals from the satellites. In this project, GPS modem get the signals from the satellites and those are given to the microcontroller. The signals may be in the form of the coordinates; these are represented in form of the latitudes, longitudes and altitudes.

GPRS:

This section consists of a GPRS modem. The modem will communicate with microcontroller using serial communication. The modem is interfaced to microcontroller

using MAX 232, a serial driver. The Global Packet Radio Service is a TDMA based digital wireless network technology that is used for connecting directly to internet. GPRS module will help us to post data in the web page directly.

IV. RESULTS:

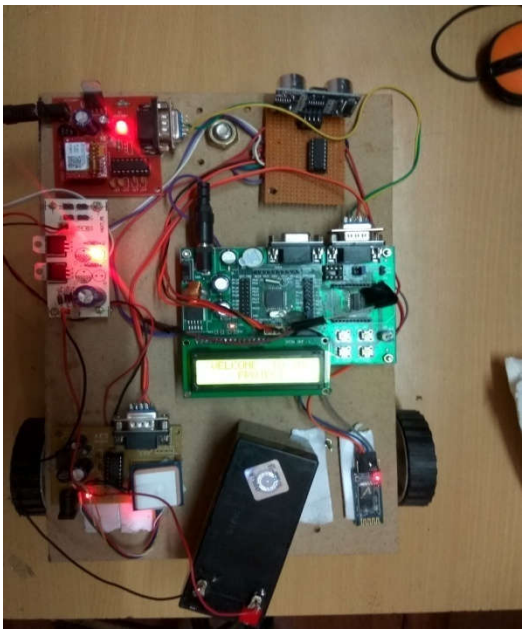


Fig (4.1): output on LCD

CONCLUSION

In this paper an efficient approach of multiple control system is incorporated with IOT. Controlling multiple devices in multiple ways makes causes more convenience in handling a system. The cloud service helps the system to reduce memory load. And also be used wherever people cannot go or where things doing too dangerous for humans to do safely. The Robotic movement is controlled remotely through the local system. It can do task more effectively and efficiently than human labor and also at same time take care of safety.

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